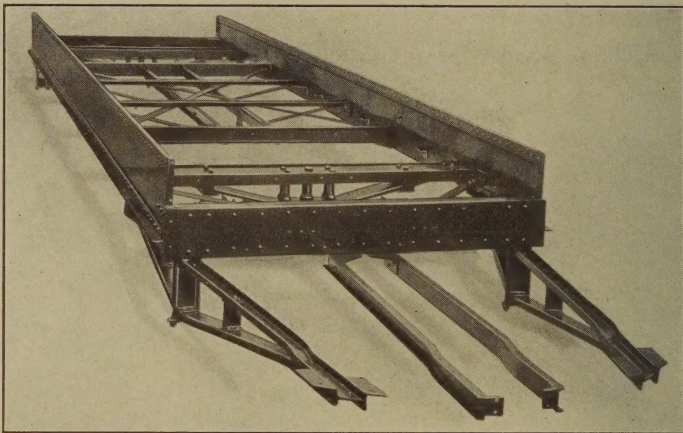


BRILL MAGAZINE



THIS ISSUE CONTAINS ARTICLE ON FIRST "NEAR-SIDE" CAR



STEEL UNDERFRAMES

The underframe illustrated is the standard design for a 30-ft. 8-in. Brill Semi-Convertible car with 6-ft. platforms and weighs 4,476 lbs. The same general design is adaptable to any type of double-truck city car. The wide thin steel sill plates are reinforced along the top and bottom edges to give the maximum strength for a minimum weight of section. Having no truss rods enables the side wall lining to be set in between the posts and the space thus saved to be utilized by the seats. The increasing demand for steel underframes has developed a large variety of types applying to all classes of passenger and baggage cars. Our facilities for steel construction enable us to accept large orders, subject to quick deliveries.

THE J. G. BRILL COMPANY
PHILADELPHIA - - - PENNSYLVANIA



A. L. C. Felt

CHIEF OFFICER OF THE LONDON COUNTY COUNCIL TRAMWAY SYSTEM

BRILL MAGAZINE

Vol. V

JUNE, 1911

No. 6

A. L. C. FELL

[WITH PORTRAIT INSERT]

AUBREY LEWELLYN COVENTRY FELL, chief officer of the London County Council Tramway System, was born in Llangollen, North Wales, in 1869. Educated at Christ Church College, Finchley, and the School of Electrical Engineering, Hanover Square, he served an apprenticeship with Laing, Wharton & Down, electrical engineers and contractors, London. Continuing with this firm, which subsequently became the British Thompson Houston Company, he was placed in charge of many important electric traction and lighting installations. He left the British Thompson Houston Company in 1897 to become the electrical engineer of the Sheffield Corporation Tramways, and three years later, after having installed the complete electrical equipment for the tramway, including the power station, became the general manager of the system and was thus engaged when, in 1903, he was selected chief officer of the London County Council Tramways. The London, Deptford & Greenwich, the London, Camberwell & Dulwich, the Woolwich & Southeast London, the North Metropolitan and the London Southern Tramway Companies have been acquired by the London County Council since Mr. Fell has been at the head of the tramway system. The staff under his management numbers 11,000 persons and his responsibilities include the management of the whole system, including the central power station at Greenwich and the central repair depot at Charlton. He is a member of the Institution of Electrical Engineers, the Institution of Mechanical Engineers and other institutions and associations.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

BERLIN*

BERLIN, the capital of Prussia, residence of the German Emperor and the seat of the Imperial Government, has a population of about three and one-quarter millions, including its immediate suburbs. The city is situated in the broad level valley of the navigable river Spree and is the chief center of the railway system of Germany. Berlin is the first commercial center of the country and the greatest manufacturing city of continental Europe. The boundaries of the city proper enclose an area of twenty-five square miles and its twenty-six suburbs have an area of ninety-five square miles, making a total of one hundred and twenty square miles. It is essentially a modern city, as the photographs show, the many ancient two-storied houses which formerly characterized it having given place to blocks of splendid buildings. The west end and the southwest are the residential quarters; the northwest is largely occupied by academic, scientific and military institutions; the north is the seat of machinery works; the northeast of the woolen manufactures; the east and southeast of the dyeing, furniture and metal industries, while in the south are great barracks and railway works.

Aside from the Städtichen Strassenbahnen, or municipal street railway, a line running around the northern and eastern parts of the city, the street railways of Berlin and suburbs are operated by the Grosse Berliner Strassenbahn and its allied companies. This company operates about 3,000 motor cars and 1,000 trailers, over about four hundred miles of track. The lines of the company are in nineteen distinct municipalities, with franchises of widely differing character. Within

* The thirtieth article of this series.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Street railway map of Berlin. The broad lines indicate the Städtischen Strassenbahnen (Municipal Street Railways) and the narrow lines represent the Grosse Berliner Strassenbahn

the last few years the elevated and subway lines and motor omnibus lines have come into competition with the street railways, but in spite of this fact the business of the company has steadily increased and the traffic has grown in greater ratio than the population of the city and suburbs—large as that has been. It is interesting to observe that 80 per cent. of the company's entire traffic is handled in Berlin proper, with 70 per cent. of the total car miles operated and 52 per cent. of the total trackage. These figures show that the suburban districts have not yet reached the most profitable point of travel density.

All cars of the subsidiary companies are maintained in the shops of the parent company, but each corporation owns its own cars. The contract between the companies calls for the

through operation of any car over any desirable combination of routes; each company, however, is directly in charge of the service over its tracks and therefore must assume all legal responsibility and all injury and damage suits, etc., involved in its particular section. Employees of each company are bound by the rules and instructions of the line over whose tracks they are running.

The traffic development of Berlin is of a radical character.



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Potsdamer Platz. This square is at the west end of Leipziger Strasse, the busiest street of Berlin, and from here radiate nearly all the lines of the western section of the city

Nearly all of the cars traverse a part of Leipziger Street, the main business thoroughfare, after which they radiate in all directions. It has been the policy of the company to run through cars to each part of the city as far as possible; therefore, as a result, only about 15 per cent. of the passengers transfer. The standard cash fare on most of the lines has been $2\frac{1}{2}$ cents, and on a few extensions $3\frac{3}{4}$ cents; no free transfers are issued, except on a small part of one of the lines. The highest fare charged on any line interconnected with the

suburban system is 5 cents. Workmen's tickets and school tickets are issued at low rates by the week and monthly tickets for an unlimited number of rides can also be obtained at a low rate. The average length of ride throughout the main system on a certain week day two years ago was 2.14 miles and the average receipts per passenger-mile 1.05 cents. About 25 per cent. of the total mileage is made by trailers. The cost of operating per motor-car-mile at that time was

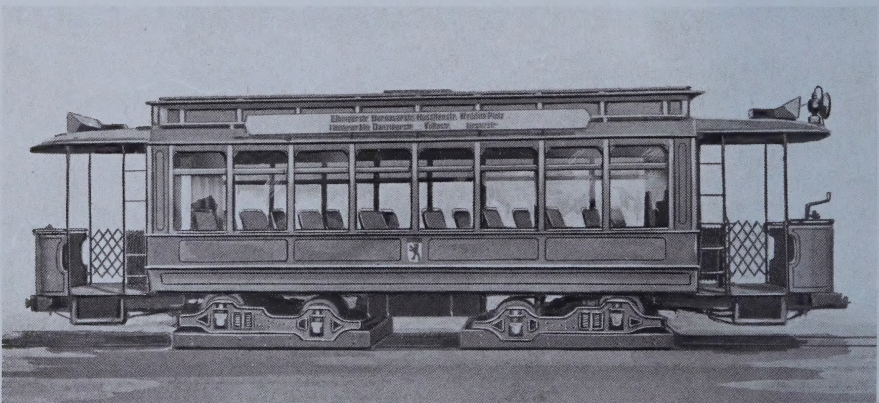


CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Spittelmarkt. This point is at the east end of Leipziger Strasse, and most of the cars for eastern part of the city pass through here

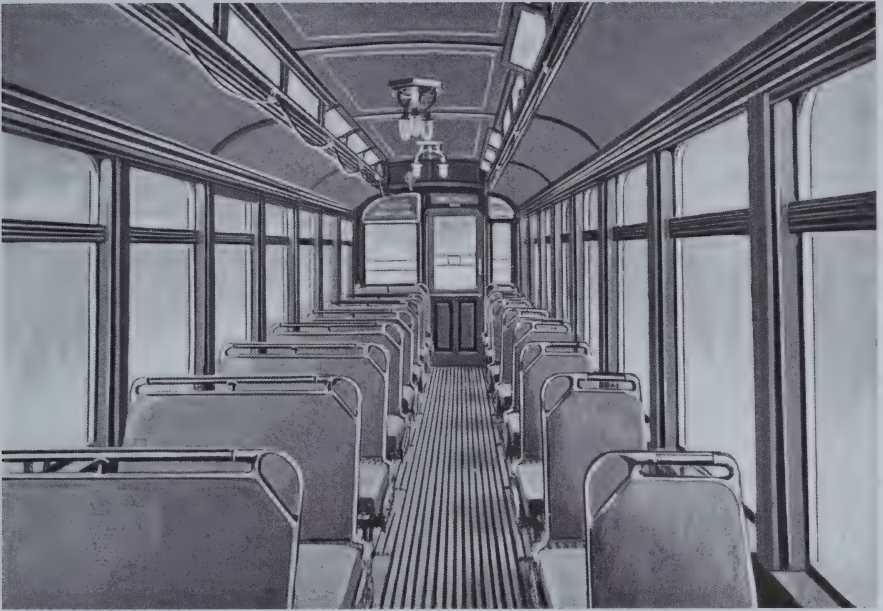
10.08 cents and the cost per trailer-car-mile 5.02 cents. The traffic on each line is carefully and regularly charted to assist the transportation department in arranging and selecting its schedules. Daily records of the temperature and weather conditions are also charted. For a number of years the company has paid over 8 per cent. dividend on about \$25,000,000 stock. Last year a dividend of 8 per cent. was paid.

The car shown in the photograph on page 162 is one used on the municipal line, but is typical of the double-truck car

used throughout the city. Of late years all of the cars ordered by any of the companies has been of the double-truck, semi-convertible type. The single-truck car shown in the foreground of the illustration on the cover of this issue and the double-truck car just referred to, are the two principal types used in Berlin and weigh, fully equipped, respectively about 18,700 lbs. and 28,600 lbs. The older types of Berlin cars have large windows with stationary lights and a center window, which alone is adjustable. The double-truck cars ordered during recent years are all of the semi-convertible type and have individual windows which lower into pockets into the side walls. The platforms are long and intended to hold seven passengers on the front platform and eight on the back platform; no passengers are allowed to stand inside the car. The reversible transverse seats with which these cars are furnished accommodate twenty-four passengers. Owing to the narrowness of the car the aisle is placed at one side of the center, and the seats on one side of the aisle hold only one person. Other interesting features of this car are the head lights and marker lights which are carried on the hood, the ventilator on the end of the monitor, the hose coupling through the upper part of the dash, the steel ladder at each side of each



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Typical double-truck semi-convertible car of the Berlin street railways



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE. Interior of the car shown on the opposite page. Seating capacity, 24. No passengers are allowed to stand inside. The front platform accommodates seven standing passengers and the rear platform, eight

platform which give access to the roof, and the wheel fenders which completely surround each truck. The cars of every route receive a distinctive Arabic number if it is a city line, and a Roman number or letter if it is a suburban line. These symbols are not picked at random, but as nearly as possible neighboring numbers, chosen for lines operating in the same territory. Thus, lines "G" and "H" overlap one another for a considerable distance, so that most travelers can choose either route. The number assigned to each line is marked in black on the whitened glass discs of the end lantern alongside the destination sign of the cars. The numerals or letters are very large and therefore visible at a considerable distance.

Besides these end signs, each car carries two long non-illuminated side signs which bear a list of all important places on the route. Inside the car the passengers will notice a sign which gives still further details concerning the route,

together with the schedule, fare, riding regulations and running time between the terminals.

The car maintenance problem is greatly simplified by at least three important factors, namely: a highly efficient class of motormen, whose methods of running are under strict control; well-kept road beds, often semi-private, laid in clean level streets; and contiguity to the principal electric concerns, thereby eliminating the need for the home manufacture of many items. The motor and trailer cars are overhauled and painted in rotation, about every two years, when they go into the central shop for four or five weeks. Usually these shops take care of eighteen motor cars and eight to ten trailers at one time, although fifty cars could be handled. The motormen undergo an unusually thorough course of instruction because they are allowed to operate cars.

Besides the surface lines Berlin has the Elevated & Underground Electric Railway System which runs through the southern part of the city, furnishing fast and comfortable transportation from the center of the city to a number of the southern suburbs. The Ringbahn is a steam railway completely encircling the city. Motor omnibus lines are very numerous and traverse all of the important thoroughfares not served by the railways. They carry about one-fourth as many passengers as the combined street railway systems. Two years ago the Grosse Berliner Strassenbahn published some accident records which were of particular interest owing to the comparison made with accidents due to omnibuses. It was shown that the trackless omnibuses run over more pedestrians than the street cars. The accidents on surface cars have decreased since that time, although the traffic has grown considerably and there has been an increase in schedule speeds.

Much of the foregoing information has been obtained from articles which have appeared in the *Electric Railway Journal* during the last two years.

IMPROVED STREET CAR SERVICE*

THE NEAR-SIDE CAR

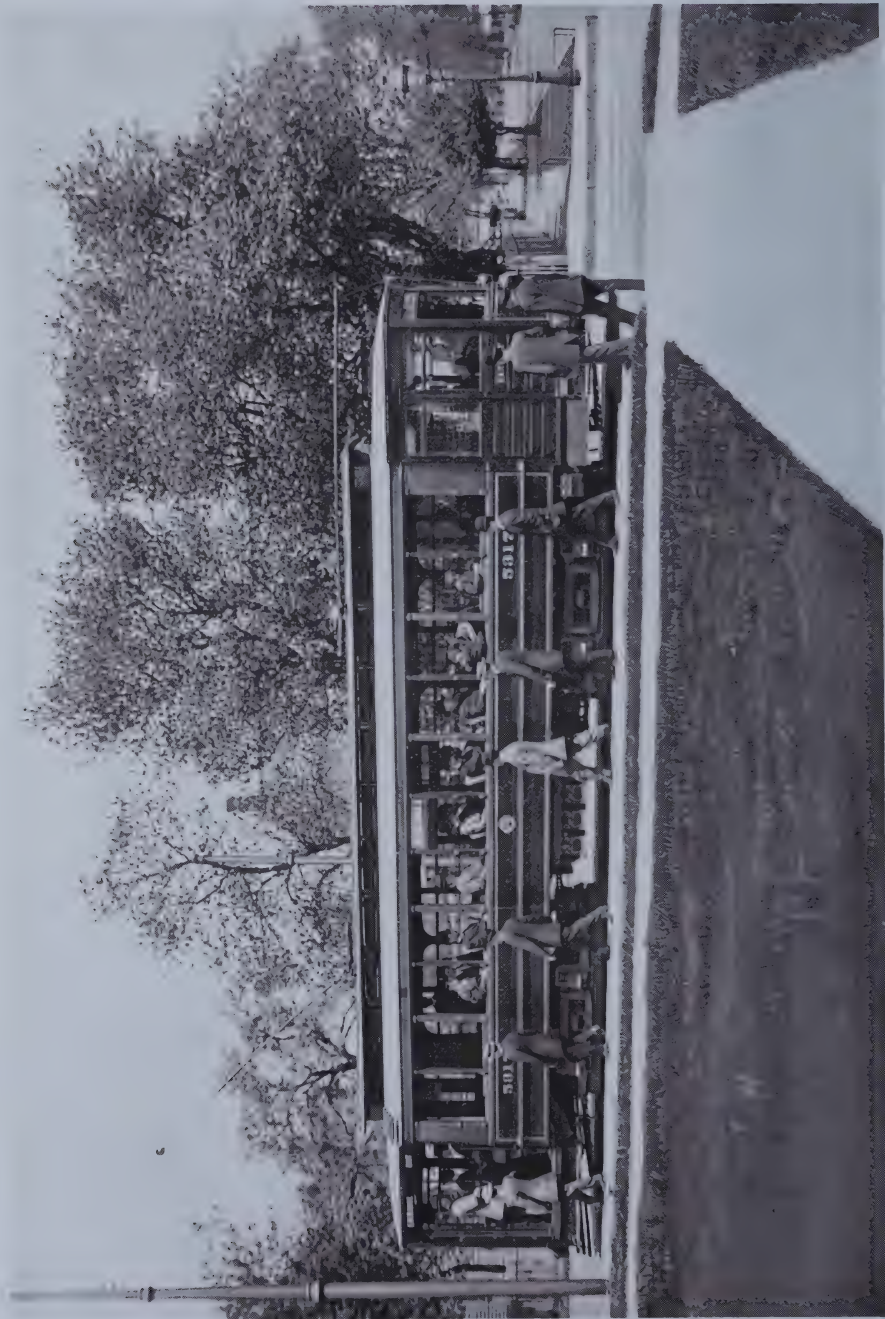
SCIENTIFIC management, when applied to the problem of transporting passengers upon street cars, should properly be directed toward the best method of securing

- (a) Maximum convenience and comfort of passengers.
- (b) Minimum possibility of accidents.
- (c) Increased comfort and efficiency of employees.

The pay-as-you-enter car, first used at Chicago in 1908, is distinguished from its predecessors by the collecting of fares by the conductor upon the rear platform. This car, as now generally adopted in the larger cities of this country, is provided with an entrance and exit upon the rear platform and an exit by way of the front platform. Under this arrangement all of the passengers are required to enter the car by way of the rear platform, and in actual practice about 70% of the passengers leave the car by way of the rear platform, as the front exit is found to be objectionable to many owing to the use of the front platform by smokers.

The traffic regulations of the police departments in the cities of Chicago, Philadelphia and Buffalo require that cars be stopped at the near side of the street for the purpose of taking on and discharging passengers, the result being that passengers are now obliged to leave the cross-walk and walk the entire length of car to secure entrance by way of the rear platform (Cut No. 1). This is often most objectionable, due to the muddy condition of the streets, and is productive of acci-

*A reprint of a pamphlet issued by The International Railway Company of Buffalo, N. Y. The first near-side cars were built by The J. G. Brill Company.



(Cut No. 1). Showing inability of conductor to see approaching passengers from his position on rear platform

dents because of the inability of the conductor to see approaching passengers from his position on the rear platform, the car frequently starting simultaneously with the prospective passenger coming into view of conductor. The consequence is that about 50% of the total accidents incident to the operation of street cars occur to passengers in the act of boarding or alighting from the cars.

As best illustrating the short-comings of the present method in this regard, an actual example of every day procedure at the hour of rush travel is here given:

From 5 to 15 or more passengers board the rear platform of a car at the near crossing of a principal street. The conductor then collects and registers the fares, makes change, issues transfers and when all passengers are aboard gives the starting signal to the motorman by means of a bell cord.

It is at just the moment of giving the starting signal that the principal weakness of the present method exists, as the conductor, at this particular moment, busily engaged in the collection of fares, must be sure before giving the starting signal that there are no passengers getting on or off the car by way of the rear platform. To give the go-ahead signal without being entirely sure that all passengers intending to take the car are safely aboard is productive of accidents, while, should the conductor hesitate unduly, car service upon the street must necessarily be delayed, as during the hours of maximum travel cars often follow each other through the down town terminal streets 20 seconds apart.

After the conductor has given the go-ahead signal the car does not immediately move forward, there being a perceptible interval of time consumed in conveying the thought to the mind of the motorman by means of the signal bell, and in energizing the motors by him through the medium of the electrical controller. This interval is often sufficient to permit the heretofore unseen passenger to appear and be in the act of getting on the car just as it starts.

By this example the conductor is shown to have too many duties to perform at the particular moment when the starting signal is given, and as at this time the motorman is at ease, waiting only for the starting signal, it is evident that a better distribution of effort would result if some portion of the conductor's duties at this moment could be delegated to the motorman.

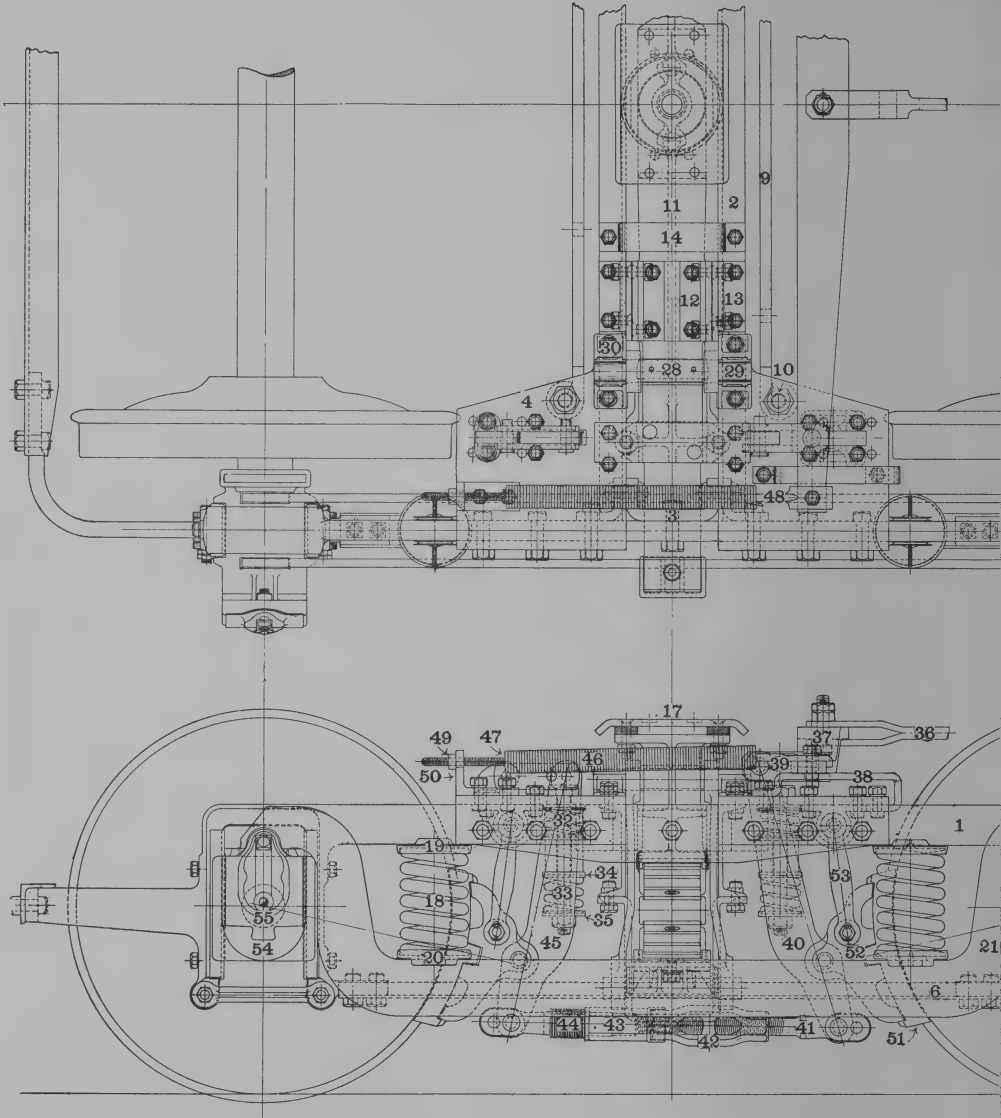
Another and a particularly severe class of accidents is occasioned when stopping cars on the near side of the street, by passengers leaving the car by way of the rear platform and passing directly behind the car from which they alight and into the path of a car or automobile approaching from the opposite direction (Cuts Nos. 2 and 3). The passenger, when in this position, is at least 40 feet away from the cross-walk and so beyond the protection of the crossing policeman. The approaching car having made its stop on the opposite side of the street has consequently attained considerable speed, and, as the view of the motorman is obstructed by the standing car, serious and oftentimes fatal accidents result.

The work of both motorman and conductor has so changed during the last decade as to now make the motorman an expert operator of machinery, and the conductor an expert cashier, the duties of both being best performed when they are given proper protection from the weather. The present practice of conductors wearing heavy gloves and other bulky clothing necessary to their protection from the cold when in an exposed position upon the rear platform is not conducive to the most rapid and accurate performance of their duties.

Health Department requirements make necessary the stopping of smoking and spitting in street cars, and require a system of ventilation which should be automatic in character. The system in general prescribed is one which provides for the intake of fresh air over the electric heaters, insuring an even temperature during winter months, and the discharge of the foul air at the top of the car by means of ventilators.

(PATE

(PATE

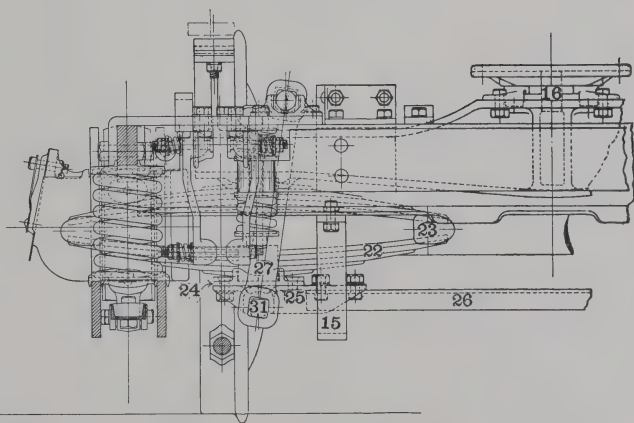
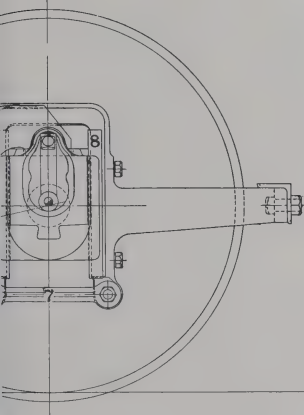
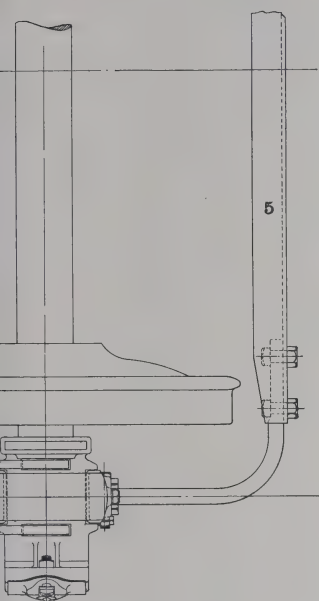


Names of Parts

- | | |
|------------------------------|---------------------------------|
| 1 Side Frame | 15 Spring Plank Safety Hanger |
| 2 Transom | 16 Truck Center Plate |
| 3 Transom Corner Bracket | 17 Side Bearing Wear Plate |
| 4 Transom Gusset Plate | 18 Equalizer Spring |
| 5 End Frame | 19 Equalizer Spring Cap |
| 6 Pedestal Tie Bar | 20 Equalizer Spring Seat |
| 7 Pedestal Cap | 21 Equalizer or Equalizing Bar |
| 8 Pedestal Gib or Wear Plate | 22 Bolster Spring |
| 9 Motor Suspension Bar | 23 Bolster Spring Scroll |
| 10 Motor Suspension Bar Bolt | 24 Bolster Spring Seat |
| 11 Bolster | 25 Bolster Spring Seat Rocker |
| 12 Bolster Chafing Plate | 26 Spring Plank |
| 13 Transom Chafing Plate | 27 Swing Link or Bolster Hanger |
| 14 Transom Tie Bar | 28 Swing Link Pin (Top) |

I. C. B. TRUCK

(RED)



- 29 Swing Link Pin Pivot
- 30 Swing Link Pin Bearing
- 31 Swing Link Pin (Bottom)
- 32 Motor Suspension Spring (Top)
- 33 Motor Suspension Spring (Bottom)
- 34 Motor Suspension Spring Cap
- 35 Motor Suspension Spring Seat
- 36 Brake Rod
- 37 Radius Bar
- 38 Radius Bar Guide
- 39 Radius Bar Clevis
- 40 Live Lever
- 41 Brake Turnbuckle End
- 42 Brake Turnbuckle

- 43 Brake Turnbuckle Lock
- 44 Brake Turnbuckle Lock Spring
- 45 Dead Lever
- 46 Brake Release Spring
- 47 Brake Release Spring Casting
(location indicated)
- 48 Brake Release Spring Hook Bolt
- 49 Brake Release Spring Nut
- 50 Brake Release Spring Clip
- 51 Brake Shoe
- 52 Brake Head
- 53 Brake Hanger
- 54 Journal Box
- 55 Journal Box Lid



(Cut No. 2). Leaving car by way of rear platform, and passing directly into the path of a car approaching from opposite direction



(Cut No. 3). Leaving car by way of rear platform, and passing directly into the path of automobile approaching from the opposite direction

This necessitates doing away with transoms in the monitor roof which are now used for the double purpose of intake and discharge of air.

The illuminated destination signs now in use seem to be inadequate to the extent that prospective passengers cannot determine the identity of the car when at a distance. This has best been remedied in European cities by the use of large numerals or letters to designate the different routes.

The result of this study leads to the conclusion that the use of the near side of the street by street cars for loading and unloading purposes, makes necessary the development of the front platform as the principal means of entering and leaving the car, and if the rear end of the car be used only as an emergency exit, the collection of fares by the conductor upon the front platform is at once made practicable.

The use of the front platform for both loading and unloading purposes makes possible a better division of duties between the motorman and conductor, in that the motorman may be given entire responsibility for the starting and stopping of the car and the safety of passengers boarding and alighting, the conductor's duties then being confined to the collection and registration of fares, issuance of transfers and calling of streets, thus avoiding much lost motion and minimizing the possibility of accidents.



(Cut No. 4). HB Life Guard in action

The improvements made possible by the adoption of this use of the front platform seem to justify its full development, thereby overcoming many of the defects of the present system. To that end the car now to be described has been produced, and will be hereafter referred to as The Near-Side Car.

THE NEAR-SIDE CAR

The entrance and exit are both by way of the front platform, enabling passengers to enter and leave the car directly at the cross-walk on the near side of the street.

Duties are equally divided between the motorman and conductor and each is rendered more efficient.

The Motorman is provided with a seat, and in the operation of the controlling devices, is protected from interference by a dividing rail. His vision is guarded against reflected light by means of an adjustable curtain. He controls the entrance and exit by a convenient lever, operating both the in and out folding doors and steps, separately or simultaneously, at will.

While the car is at a standstill, the motorman can plainly see the passengers entering and leaving the car and is thus able to act promptly and safely in operating the folding doors and steps, getting the car under way without the loss of time heretofore encountered through the necessity of waiting for the bell signal.

When the car is in motion passengers are not permitted to remain upon the platform. The motorman's attention is not, therefore, diverted as heretofore. This serves to more certainly assure his seeing persons signalling from the street and results in a greater alertness on his part in the avoidance of accidents by collision.

The Conductor is provided with a seat within a guarded space directly opposite the entrance to the front platform. In this position he is able to control the entrance passage into



(Cut No. 5) Entrance and exit at front platform only; passengers approach, enter and leave car directly under the motorman's eye

the body of the car, and is amply protected from the weather, so that he may, at all times, be clothed in a way best suited to the rapid performance of his duties.

When the car is at a stand still taking on passengers, the conductor has only to collect fares and issue transfers. This he is able to do much more rapidly than heretofore, as he is now relieved of the necessity of watching the step and giving the go-ahead signal. The entrance portion of the front platform will accommodate from ten to fifteen on-coming passengers, which, under these conditions, will be amply sufficient.

When the car is in motion, the conductor in either seated or standing position, is directly facing the passengers. Thus placed he can most readily observe the signals of those passengers who cannot conveniently reach the passenger's signal push button. Having no other duty to perform while the car is in motion, the conductor is able to call the streets as required, and as he is facing the passengers the names of the streets announced are much more easily heard and understood.

The exit at the rear end of the car, to be used in case of emergency or at points where the car is to be entirely unloaded, as at base ball games, etc., may be readily operated either from the rear end of the car or by the conductor from his position on the front platform.

Passengers alighting from a car by way of the front platform and passing across in front of it have a direct view of cars or automobiles approaching from the opposite direction. Should they desire to pass behind the car from which they alight they must necessarily await its forward movement. These conditions serve to prevent the accidents which have heretofore occurred because of passengers alighting from the rear end of a car and passing directly behind it and into the path of a car or automobile approaching from the opposite direction.

The ventilating system is automatic and, therefore, not dependent upon the action of conductor or the whim of



(Cut No. 6) Illuminated Route Letter, Destination and "Car Full" signs, HB Life Guard with Supplementary Wheel Guard, and "Safety Grab Handle around car front

the passenger. The fresh air is brought in over the electric heaters, which are controlled by a thermo-stat guaranteed to automatically regulate the degree of heat, thereby insuring an even temperature during winter months. The foul air is discharged through nine registers placed in the ceiling directly over the seats. These registers are connected with ventilators placed at intervals on the roof of the car. The vacuum created by the motion of the car draws out the foul air with such rapidity as to insure an entire change of air within the car during each three and one-half minute interval, this being slightly in excess of the Health Commission requirements.

To provide against the inadequacy of the usual destination signs, a large illuminated white letter on black background occupies the upper half of the right-hand front vestibule window. This designates the route on which the car is running and is sufficiently large to be visible by day or night for a distance of several blocks. Supplementary thereto the side destination sign occupies the full length of the opening immediately over the entrance and exit doors at the curb side of the front vestibule. The car is also supplied with a "Car Full" sign, (Cut No. 6) which is to be dropped into place whenever the agreed number, constituting a maximum car load, has been taken on. (Cut No. 8.) This should prevent the extreme overloading of cars.

The H. B. life guard, adopted by the New York State Public Service Commission as being the best after severe competitive tests, when used in connection with the supplementary wheel guard, has shown an efficiency of 96% in the saving of life during six months' use in Chicago. This life guard has been adopted as standard, there being nothing as yet developed which seems to be its equal in efficiency.

The safety grab handle around the front vestibule (Cut No. 6) is so designed and placed as to be most readily seized by a person about to be struck by the car (see Cut No. 2) and should, in some instances, serve to prevent their being thrown thereunder.

The space heretofore occupied by the rear platform is in this car utilized for seating purposes, resulting in a largely increased seating capacity. (See Cut No. 7 and comparative figures shown on page 177).

The car as described operates ordinarily from one end only, necessitating the use of loops or wyes at the ends of lines. It is, however, so equipped as to permit of its being run in the reverse direction in case of blockades, or like emergencies. This single-end type of car permits the use of a non-reversible cross-seat, which, with the so-called semi-convertible type of construction adopted, results in a considerably increased width of aisle and length of cross-seat cushion without increasing the over-all width of the car.

Maximum traction center bearing trucks are used, permitting the use of two-motor instead of four-motor equipments. This accounts for the greatly reduced weight, and also reduces the height of car floor, with the result that the lower step of the car is carried 2 inches nearer to the ground.

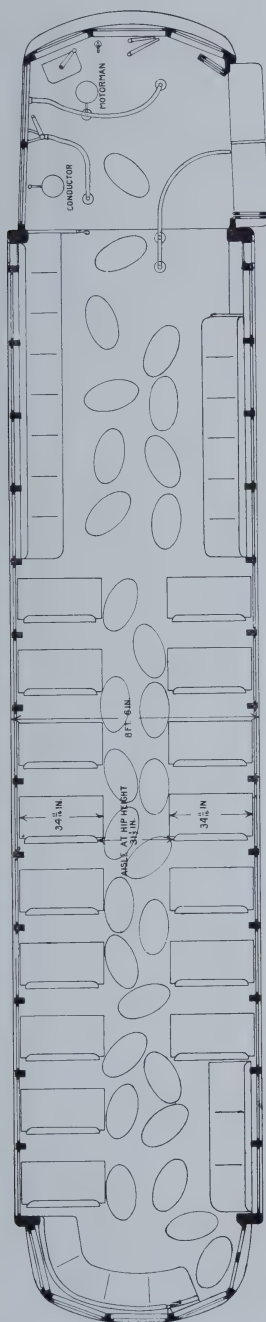
The efficiency of the motors and trucks here used has been proven by several months of test under Chicago winter conditions coupled with unusually severe schedule requirements.

The seating capacity, dimensions, weight, etc., of the near-side car, as compared with the present pay-as-you-enter standard, now used in Buffalo and Chicago, are as follows:

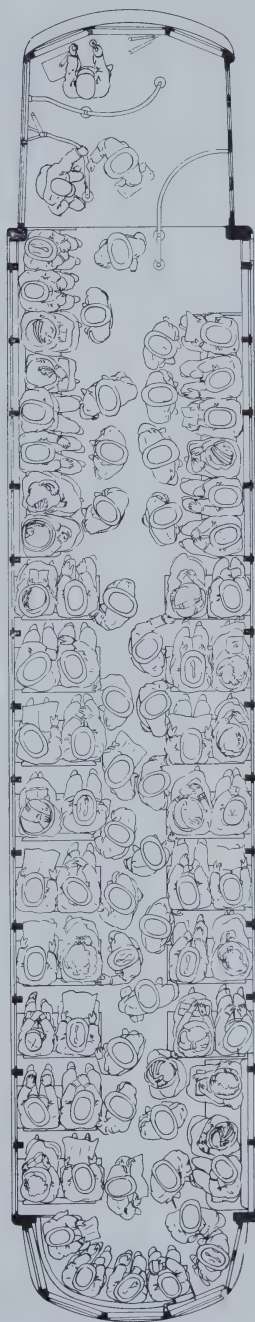
	Near-side Car.	Pay-as-you-enter Car.
Seating capacity	53	40
Length of cross-seat cushion	34 $\frac{11}{16}$ "	34"
Width of aisle, at hip height ..	31 $\frac{1}{2}$ "	27"
Width of car	8' 6"	8' 6"
Length of car, over all ..	45' 2"	45'
Height of car	12'	12' 5"
Height of lower step from ground ..	14"	16"
Weight of car, fully equipped	39,000 lbs.	52,000 lbs.



(Cut No. 7) Interior of Near-side car, with seated load of 54 persons, showing extra wide aisle and ventilating registers in ceiling



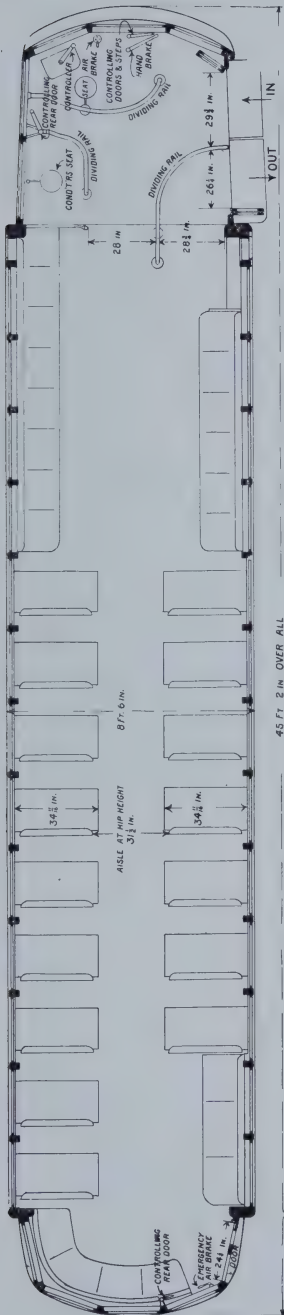
Floor plan of Near-side car. Maximum load 83 persons; 53 seated of whom 35 face forward; 30 standing passengers are represented by ovals occupying 12 inches by 18 inches each



Floor plan of Near-side car. View shown is as though looking down upon passengers with top of car removed. Motorman and conductor are shown in position with passenger paying fare. The 30 standing passengers are occupying the same relative position and space as described by the ovals in the upper print (Cut No. 8)



(Cut No. 9). Side view of Near-side car, showing high window openings and mushroom type ventilators



Floor plan of Near-side car. Seating capacity 53 persons, of which 35 face forward

NOTE—The "Near-side car" was developed under the personal direction of Mr. T. E. Mitten and the details were worked out by Mr. Ralph T. Senter, of Buffalo, N. Y.

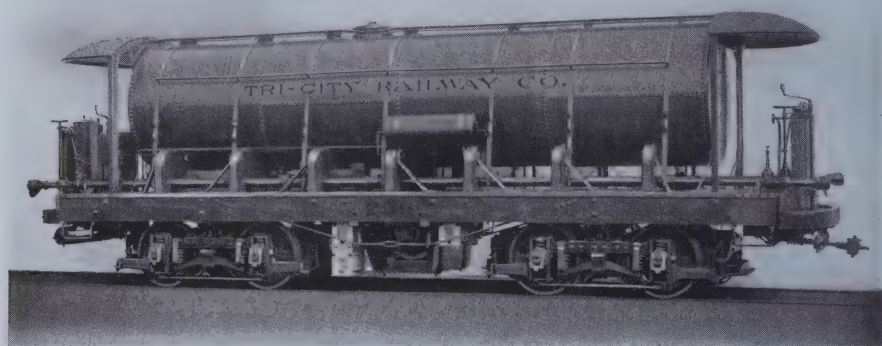
Dr. W. A. Evans, Health Commissioner of Chicago, who is recognized as one of the foremost experts on ventilation, has given most valuable assistance in the development of the combined heating and ventilating system. The general excellence of this system of heat regulation and ventilation is approved by Dr. Francis E. Fronczak, Health Commissioner of Buffalo.

The Near-side car was developed primarily to meet the requirements of the New York State Public Service Commission, Second District, whose expert railroad inspector, Mr. Charles R. Barnes, has been most helpful by suggesting improvements in the detail of the car. The Commission following a careful inspection of the sample car, built for that purpose, has authorized the purchase of 35 of these Near-side cars which will be in operation at Buffalo, New York, in September of this year.

CENTRIFUGAL SPRINKLING CAR FOR DAVENPORT, IOWA

CAPACITY 4000 GALLONS

THE double-truck centrifugal sprinkling car illustrated was furnished this spring to the Tri-City Railway Company, of Davenport, Iowa, by The J. G. Brill Company, and is the first of this type used in Davenport. The Brill



CENTRIFUGAL SPRINKLING CAR FOR DAVENPORT, IOWA. A standard 4,000-gallon Brill Centrifugal Sprinkler (patented) mounted on Brill No. 27-GE2 trucks. The air brake cylinder is placed at the side above the car floor

centrifugal sprinkler, since its introduction in 1905, has been widely recognized as the most efficient sprinkling machine that has ever been devised, and, besides being used in various parts of the United States, has been supplied to railway systems in France, Spain, Italy, Japan and several cities in South America. Three centrifugal sprinklers were shipped this spring to the Rio de Janeiro Tramway, Light & Power Co., which company received six of the same type in 1908.

The discharge apparatus of the double-truck centrifugal sprinkler consists of a single pipe leading from the bottom of the tank close to a motor-driven centrifugal pump hung

at the center of the car, from which a direct piping connection is made along one side of the car to four sprinkling heads, one at each corner of the car. The pump is operated by a 20 h.p. motor, at a speed which furnishes pressure sufficient to sprinkle about 35 feet of roadway on each side of the car at the same time, with the sprinkling heads half open, which is their normal adjustment for the average street conditions. With the exception of the gate valves, there are but two valves in the piping, one on the suction pipe leading to the pump and the other on a connection between the delivery pipe and suction pipe. The latter is a special spring valve which opens automatically when the sprinkler heads are closed and prevents back pressure on the motor; it also serves to regulate the pressure, the amount of which is registered on the gage. A stopcock is provided for filling the tank under pressure and a fitting, located close to the pump port, for filling by suction. The gate valve near each sprinkling head enables the water to be cut off without altering the adjustment of the sprinkling heads. The sprinkling heads have a cylindrical slot for half the circumference of the head and a revolvable chamber with a corresponding slot. The amount and range of water are accurately and quickly controlled by hand wheels.

The tank is filled from plugs which the railway company had placed between the tracks at suitable intervals along the line, covered with manhole covers. A 15-ft. section of hose is used for this coupling.

Length over platforms . . . 31 ft. 0 in.	Diameter of wheels 0 ft. 33 in.
Diameter of tank 5 ft. 4 in.	Size of journal 0 ft. 4¼ in.
Length of tank 24 ft. 0 in.	Motors West, 101-B—4-40 h.p.
Width over sills 7 ft. 6 in.	Wt. of car body, less elec. equipment 22,000 lbs.
Extreme width 7 ft. 6 in.	Wt. of electrical equip. . . . 1,100 lbs.
From track to sills 2 ft. 7⅞ in.	Wt. of air brake equip. . . . 1,500 lbs.
From sills over trolley boards 10 ft. 4 in.	Wt. of trucks 12,400 lbs.
From track to floor 0 ft. 21½ in.	Wt. of motors 11,000 lbs.
Type of trucks Brill 27-G2	Total weight 48,000 lbs.
Wheel base 4 ft. 6 in.	

THIRTY MORE P-A-Y-E CARS FOR VANCOUVER, B. C.

SINGLE-END TYPE

THE British Columbia Electric Railway Company has lately added to its equipment thirty new cars of the Pay-As-You-Enter semi-convertible type built by the American Car Company. The cars are for use on the Vancouver lines and are similar to the equipment described in BRILL MAGAZINE of January, 1910, except that instead of being arranged for double-end operation the new cars are controlled from one end only, as the lines on which they have been placed have loop terminals. Like their predecessors, the cars are mounted on Brill No. 27-G trucks.

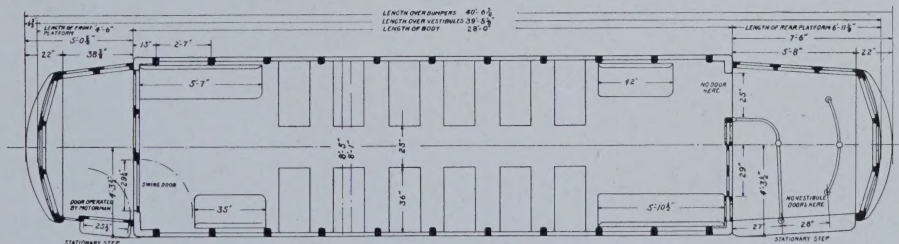


THIRTY MORE P-A-Y-E CARS FOR VANCOUVER, B. C. Interior of car looking toward rear platform. The entrance door is omitted between platform and car. The exit is provided with mutually-operated doors



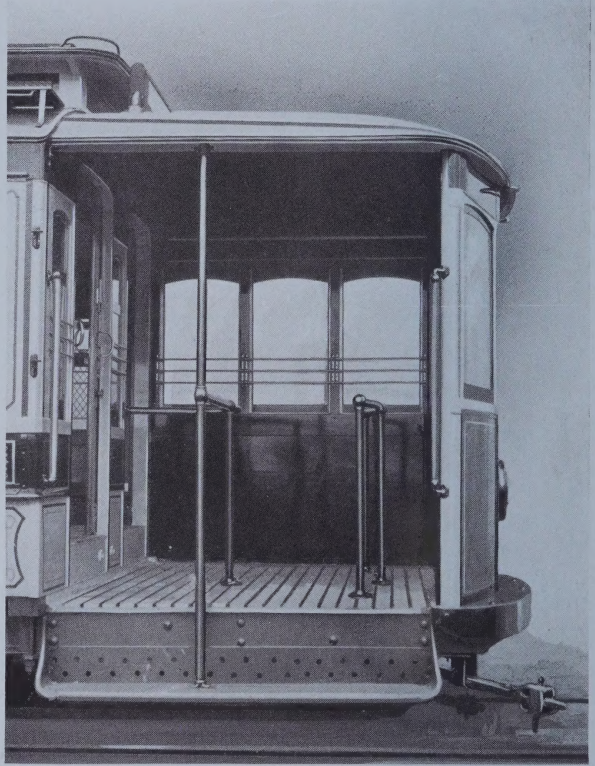
THIRTY MORE P-A-Y-E CARS FOR VANCOUVER, B.C. The entrance and exits are on the left side, as the cars are run on the left-hand track. The cars are mounted on Brill No. 27-G1 trucks

The system of the British Columbia Electric Railway Company comprises about one hundred miles of track with about one hundred passenger cars in operation. A general description of the system was given in the January, 1910, issue of BRILL MAGAZINE. The new cars have the Brill standard semi-convertible window system and, as can be seen by the photographs of the interior, the right side of the car is equipped with high wire net guards as a protection to passengers from passing cars and vehicles, the window sills being extra low in this type of car. The lighting arrangement provides a lamp over every cross seat and a single row of lamps down the center of the car. The floor plan of the car shows the general features and it will be seen that the entrance and exits are on the left side of the car to provide for running on the left-hand track. The front platform has an exit at the



THIRTY MORE P-A-Y-E CARS FOR VANCOUVER, B.C. The front exit door is mechanically operated by the motorman. The seating capacity is 38

left side with folding door operated by the motorman. The rear exit has a pair of mutually-operating sliding doors in the body end, and no door is provided in the entrance from the platform into the car. The comparatively mild winters of Vancouver make it unnecessary to have a door in this opening. The rear platforms are arranged to accommodate standing passengers and are provided with



THIRTY MORE P-A-Y-E CARS FOR VANCOUVER, B. C. Passengers are permitted to stand behind the railing at the rear of the platform

a railing to serve as a hand rail and also to form a passageway for on-coming passengers.

The principal dimensions and weights are as follows:

Length of body	28 ft. 0 in.	From step to platform . . .	14 in.
Length over platforms . . .	39 ft. 5½ in.	From platform to car floor .	8¼ in.
Length of front platform . .	4 ft. 6 in.	Seating capacity	36
Length of rear platform . . .	6 ft. 11½ in.	Type of trucks	Brill 27-G1
Centers of side posts	31 ft. 0 in.	Motors	West. 101-B-2—2 40 h.p.
Width over sills	8 ft. 1½ in.	Weight of car body, less electrical equipment . . .	18,000 lbs.
Width over posts	8 ft. 5 in.	Weight electrical equipment including motors	10,000 lbs.
Extreme width	8 ft. 9 in.	Weight air brake equipment .	1,000 lbs.
From track to sills	2 ft. 8⅞ in.	Weight of trucks	12,000 lbs.
From sills over trolley b'ds .	8 ft. 3⅞ in.	Total weight	41,000 lbs.
From floor to headlining . .	7 ft. 8⅞ in.		
From track to step	16⅞ in.		

PAY-WITHIN CARS FOR CENTRAL PENN-
SYLVANIA TRACTION CO.,
HARRISBURG, PA.

BRILL PLAIN ARCH ROOF

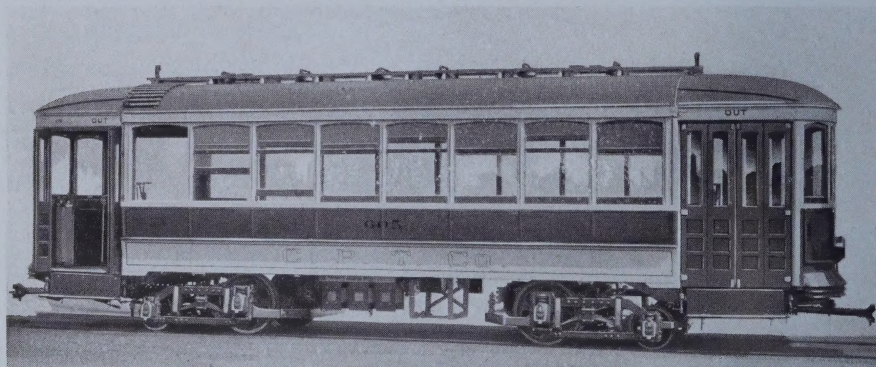
SIX Pay-Within cars with the Brill plain arch roof and two cars of regular type with monitor roof were put in service last month on the lines of the Central Pennsylvania Traction Company at Harrisburg, Pa., and were built by The J. G. Brill Company. The Pay-Within cars are the first of this type to combine the Brill semi-convertible window system, plain arch roof and longitudinal seats. The four-part folding doors which close each side of the vestibules are



PAY-WITHIN CARS FOR CENTRAL PENNSYLVANIA TRACTION CO., HARRISBURG, PA. These are the first pre-payment cars to combine the Brill Semi-Convertible window system and longitudinal seating plan



divided into two sections, one section folding against the car body and the other against the vestibule corner post. The steps are arranged to fold in conjunction with the doors and are operated by a lever from the motorman's position. Six globe ventilators are placed along the center of the roof. The window sashes raise into pockets in the roof in the usual method of the builders. The underframing consists of 18-in. by $\frac{3}{16}$ -in. sill plates, reinforced with 3-in. by $\frac{1}{2}$ -in. plate at top and 2½-in. by 2½-in. by $\frac{3}{8}$ -in. angle at bottom;



PAY-WITHIN CARS FOR CENTRAL PENNSYLVANIA TRACTION CO., HARRISBURG, PA. Thirty-two passenger Pay-Within car with six-foot platforms. Mounted on Brill No. 39-E Trucks

the stringers and crossings are made of 4-in. channels and the end sills of 10-in. channels. The corner posts are 3⅝-in. thick and the side posts 2¾-in.; sweep of posts, 3½-in.

The principal dimensions and weights are as follows:

Length of body	25 ft. 0 in.	Interior finish, cherry stained	
Length over platforms	37 ft. 0 in.	mahogany, seating cap. . .	32
Length of platforms	6 ft. 0 in.	Type of trucks	Brill No. 39-E
Centers of side posts	3 ft. 0¼ in.	Truck wheel base	4 ft. 6 in.
Width over sills	7 ft. 7¾ in.	Diameter wheels	21 and 33 in.
Width over posts	8 ft. 2 in.	Size of journal	3¾ and 3 in.
Extreme width	8 ft. 5⅜ in.	Motors, GE-216—	2-50 h.p.
From track to sills	2 ft. 7⅞ in.	Wt. of car body less electrical equipment	14,000 lbs.
From sills over trolley boards	9 ft. 0¼ in.	Wt. of electrical equipment	1,583 lbs.
From floor to headlining	7 ft. 9 in.	Wt. of air brake equipment	1,217 lbs.
From track to step	0 ft. 16⅝ in.	Wt. of trucks	10,000 lbs.
From step to platform	0 ft. 14½ in.	Wt. of motors	5,300 lbs.
From platform to floor	0 ft. 8⅜ in.	Total weight	32,100 lbs.